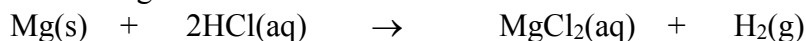


Limiting Reagent Lab: The Reaction Between Vinegar and Baking Soda

3. Prediction: _____

4. Results: Rank the test tubes in order of least to greatest amount of carbon dioxide gas (CO₂) produced.**Post Lab: Answer the following and complete the table on page.**

- Write the balanced molecular equation for the reaction that takes place during this lab. What is the identity of the gas that inflated the balloons?
- Find the number of moles of baking soda (NaHCO₃) used in each reaction: (NaHCO₃ = 84.0 g/mole)
- What is the true combining mole ratio of acetic acid to sodium bicarbonate for the reaction?
- Determine the mole ratio of sodium bicarbonate to acetic acid for each reaction. (There are 8.3×10^{-3} moles of acetic acid in 10.0 mL of acetic acid.)
- Looking at your mole ratios in number 4, identify the chemical that was in excess in each test tube. Which chemical was the limiting reactant in each test tube?
- Consider the following reaction:



(a) What is the combining mole ratio of Mg to HCl?

(b) Suppose this reaction is performed similarly to the acetic acid/baking soda reaction. A volume of HCl is put in the test tube and a mass of Mg metal is placed in the balloon. Hydrogen gas is produced and inflates the balloon. Which balloon will be the largest? Complete the following table: (There are 0.0100 mol of HCl in 10.0 mL of HCl; Mg = 24.3 g/mole).

Test Tube #	Mass of Mg, g	Moles of Mg	Volume of HCl, mL	Moles of HCl	Mole ratio Mg:HCl	Excess Reagent	Limiting Reagent
1	0.122		10.0				
2	0.500		10.0				
3	0.100		10.0				

Name _____

Test Tube #	Mass of NaHCO_3	Moles of NaHCO_3	Volume of acid, mL	Moles of acetic acid	Mole ratio: NaHCO_3 : acetic acid	Excess Reagent	Limiting Reagent
1	0.18 g		10.0				
2	0.35 g		10.0				
3	0.52 g		10.0				
4	0.70 g		10.0				
5	1.00 g		10.0				
6	1.70 g		10.0				

Name _____